

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

Claims 1-40 (canceled)

1 41 (currently amended): A method for measuring a physiological parameter,
2 comprising:
3 measuring a plurality of signals, wherein each of said signals comprises a source
4 component corresponding to said physiological parameter and an interference component;
5 processing said plurality of signals to obtain a plurality of principal components;
6 processing said plurality of principal components to obtain a plurality of
7 independent components, wherein a matrix of said plurality of signals corresponds to a matrix
8 product of a matrix of said plurality of independent components and a matrix of mixing
9 coefficients; and
10 extracting a first measure of said physiological parameter corresponding to said
11 source component from one of said plurality of independent components, wherein said plurality
12 of signals corresponds to sensed optical energies from a plurality of wavelengths,
13 and wherein said processing said plurality of principal components comprises
14 maximizing a function of ~~the higher-order cumulants~~ a third-order cumulant of a mixture of said
15 plurality of signals, thus separating said source component from said interference component,
16 and
17 ~~wherein said higher-order cumulant is a third-order cumulant of said plurality of~~
18 ~~signals~~
19 obtaining a ratio of mixing coefficients from said matrix of mixing coefficients,
20 wherein said ratio corresponds to a ratio of modulation ratios of red to infrared signals, wherein
21 said plurality of signals comprise modulated optical signals in the red and infrared ranges.

1 42 (previously presented): The method of claim 41 wherein said physiological
2 parameter is a function of an oxygen saturation.

1 43 (previously presented): The method of claim 41 wherein said processing said
2 plurality of signals further comprises
3 obtaining a time derivative of the sensed optical energies from a plurality of
4 wavelengths.

1 44 (previously presented): The method of claim 41 wherein said interference
2 component comprises signal components caused by motion, respiratory artifact, ambient light,
3 optical scattering and other interference between a tissue location being sensed and a sensor.

1 45 (previously presented): The method of claim 41 wherein said processing said
2 plurality of signals further comprises decorrelating said plurality of signals by minimizing a
3 cross-correlation of said plurality of signals, to obtain a plurality of decorrelated signals; and
4 normalizing said plurality of decorrelated signals to obtain the plurality of
5 principal components.

1 46 (previously presented): The method of claim 41 wherein said processing said
2 plurality of signals comprises decorrelating said plurality of signals by singular-value
3 decomposition of said plurality of signals, to obtain the plurality of principal components.

1 47 (previously presented): The method of claim 41 wherein said processing said
2 plurality of signals comprises decorrelating said plurality of signals by multiplying said plurality
3 of signals by the inverse square root of the covariance matrix of said plurality of signals to obtain
4 the plurality of principal components.

48 (canceled)

1 49 (previously presented): The method of claim 48 further comprising extracting
2 a second measure of said physiological parameter from said ratio, wherein said second measure
3 of said physiological parameter corresponds to an oxygen saturation.

1 50 (currently amended): A pulse oximeter, comprising:
2 a sensor configured for measuring a plurality of signals, wherein each of said
3 signals comprises a source component corresponding to said physiological parameter and an
4 interference component;

5 a computer useable medium having computer readable code embodied therein for
6 measuring a physiological parameter, said computer readable code configured to execute
7 functions comprising:

8 processing said plurality of signals to obtain a plurality of principal components;
9 processing said plurality of principle components to obtain a plurality of
10 independent components, wherein a matrix of said plurality of signals corresponds to a matrix
11 product of a matrix of said plurality of independent components and a matrix of mixing
12 coefficients;

13 extracting a first measure of said physiological parameter corresponding to said
14 source component from one of said plurality of independent components, wherein said plurality
15 of signals corresponds to sensed optical energies from a plurality of wavelengths;

16 and wherein said processing said plurality of principal components comprises
17

18 maximizing a function of ~~the higher-order cumulants~~ a third-order cumulant of a
19 ~~mixture of~~ said plurality of signals, thus separating said source component from said interference
20 component; and

21 ~~wherein said higher-order-order cumulant is a third-order cumulant of said~~
22 ~~plurality of signals~~

23 obtaining a ratio of mixing coefficients from said matrix of mixing coefficients,
24 wherein said ratio corresponds to a ratio of modulation ratios of red to infrared signals.

1 51 (previously presented): The pulse oximeter of claim 50 wherein said
2 physiological parameter is an oxygen saturation.

1 52 (previously presented): The pulse oximeter of claim 50 wherein said plurality
2 of signals corresponds to the time derivative of the sensed optical energies from a plurality of
3 wavelengths.

1 53 (previously presented): The pulse oximeter of claim 50 wherein said
2 interference component comprises signal components caused by motion, respiratory artifact,
3 ambient light, optical scattering and other interference between a tissue location being sense and
4 a sensor.

1 54 (previously presented): The pulse oximeter of claim 50 wherein said
2 processing said plurality of signals comprises decorrelating said plurality of signals by
3 minimizing a cross-correlation of said plurality of signals, to obtain a plurality of decorrelated
4 signals; and
5 normalizing said plurality of decorrelated signals to obtain the plurality of
6 principal components.

1 55 (previously presented): The pulse oximeter of claim 50 wherein said
2 processing said plurality of signals comprises decorrelating said plurality of signals by singular-
3 value decomposition of said plurality of signals, to obtain the plurality of principal components.

1 56 (previously presented): The pulse oximeter of claim 50 wherein said
2 processing said plurality of signals comprises decorrelating said plurality of signals by
3 multiplying said plurality of signals by the inverse square root of the covariance matrix of said
4 plurality of signals to obtain the plurality of principal components.

1 57 (previously presented): The pulse oximeter of claim 50 wherein said
2 processing said plurality of principal components comprises successive transformations to
3 simultaneously minimize higher-order correlations among the outputs of the transformations.

1 58 (previously presented): The pulse oximeter of claim 50 wherein said
2 processing said plurality of principal components comprises successive rotations to minimize
3 estimated mutual information among outputs of the rotations.

59 (canceled)

1 60 (previously presented): The pulse oximeter of claim 59 further comprising
2 extracting a second measure of said physiological parameter from said ratio, wherein said second
3 measure of said physiological parameter corresponds to an oxygen saturation.

1 61 (previously presented): The pulse oximeter of claim 50 wherein said first
2 measure of a physiological parameter corresponds to a pulse rate.